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Science News-Letter

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The Weekly Summary of Current Science

A Science Service Publication

Edited by Watson Davis
Vol. XII No. 331

10¢ a copy $5 a year
August 13, 1927

ENGINEERING-PSYCHOLOGY

Wanted—An American Sign Language!

DREAM OF A ROAMING MOTORIST

Story on Page 98

INDEX TO THIS ISSUE

American Sign Language 97, 98
Ancient Cities and Modern Tribes 109
Applied Psychology 109
Azizia 111

Berman, Louis 109
Brahe, Tycho 111
Brains 101
Brooklyn Botanic Garden 103
Building and Flying Model Airplanes 101
Burbank, Luther 109

Cheeseman, R. E. 109
Children, Mental Disease in 107
Children's Work at Brooklyn Botanic Garden 103
Clusters 99
Coordinating Council on Nature Activities 103
Curious Plants, Two 104

Dielectric Phenomena 109
Dream of Roaming Motorist 97
Dunlap, Knight 105

Edison, Thomas A. 107
Eredia, Filippo 111

Gann, Thomas 109
Garber, Paul Edward 101
Gregory, Menas S. 107

Hall, Wilbur 109
Halley, Edmund 111
Harvest of the Years, The 109
Heat from Heart Beat 107
Helium, Discovery of 111
Hottest Place 111
Hubbard, John C. 99

In Unknown Arabia 109
de Laguna, Grace Andrus 109

Lehman, Ira A. 111
Lewis, Samuel J. 111
Licorice 104
Lights for Traffic 105
Lockyer, Sir Norman 111
Loomis, Alfred L. 99
Lure of the Great Smokies, The 109
Lynch, Arthur 109

Magnetism, Terrestrial Variation 111
Mars' Canals 99
Mason, R. L. 109
Maya Writings Sought 109
Mental Disease in Children 107

Nature Ramblings 104
Nature Page 103
Next Age of Man 109
Numbers, Route 106

Photography 109
Poffenberger, A. T. 109
Prominence, Solar, Studied 111

Raindrops, Size of 101
Religion Called Behaviorism, The 109
Route Numbers 106
Rubber for United States 107

Science: Leading and Misleading 109
Shapley, Harlow 99
Shaw, Ellen Eddy 103
Size of Raindrops 101
Snyder, Charles D. 107
Solar Prominence Studied 111
Sound, Speed, Lamp Tells 99
Speech: Its Function and Development 109
Star Games 103
Steinberg, S. C. 108

Thumb Sucking Dangerous 111
Todd, C. Wingate 101
Traffic 97, 98
Trumpler, Robert J. 99

Verkhoyansk, Siberia 111
Vesuvius Rumbles 109

Washington, Henry S. 107
Watkins, Albert 109
Whitehead, S. 109
Wiggam, Albert Edward 109
Wineglassful of Brains 101
Wood, R. W. 99

Wanted—An American Sign Language!

By Emily C. Davis

Can the United States—land of innumerable dialects and local mannerisms of speech—develop for itself an all-American sign language, so that its road and street signs will talk the same easily read code from coast to coast?

This is the huge problem on which engineers and other traffic experts are working. They never expect to see the day when all traffic signs will be exactly uniform everywhere. That is a trifle too much to hope for in an imperfect world. In the biggest cities congestion may make special regulations unavoidable.

But the U. S. Bureau of Public Roads and state highway officials together have worked out a standard system of signs for rural highways, and a committee on city traffic ordinances has begun to work on a standard system of suitable signals for city streets. And this means that the American sign language is actually beginning to emerge from confusion into an orderly code.

The whole affair is one of importance, not merely to the drivers of 22,000,000 American automobiles, but to every person who walks on the streets and roadways. When the man on foot who doesn't read signs comes walking briskly around a sharp curve just in time to meet a flying motorist who doesn't read signs either, there is trouble. And the man on foot is apt to fare worse than the man in the car. It is perhaps even more vital that pedestrians should understand the signals along city streets. But the percentage of pedestrians who understand what automobile drivers are trying to do at corners and stop signs and left hand turns is still not so very large in spite of campaigns to educate the public along this line.

The majority of drivers understand local traffic signals. Their trouble begins when they venture away from home, for each town and each state highway system has its own ideas as to what certain symbols should mean. A government expert on lighting problems once counted seven different uses of the yellow traffic light in different communities. And in the country there is still more variety than in towns. Out on the road, the motorist happens to pass a striped post which means "Slow down quick, curve ahead." On another road, in another state, he slows down for a striped post with a sign of some sort on it. But this time the stripes are merely painted there to make sure of catching his eye for the direction sign perched atop the pole.

Moreover, advertising experts have mastered the trick of catching the eye of the motorist, a fact which adds to the complexity of the situation. Some of the very effective advertising signs make use of the same devices that are associated with traffic signals. Electric signs that change from red to green and back again, at night, painted boards that say "Stop—get your chicken dinner at Mosquito Net Farm," or "Slow down—gas station ahead" are undoubtedly good advertising. But after a while the motorist tends to become less keen to the significance of the real warning signs. Instead of STOP carrying an instant, unmistakable message, the driver must look again to make sure that the sign is an official order and not a clever advertiser's plea.

Getting the Facts

The chaotic variety of signs and symbols in use began to attract the attention of traffic experts some time

(*Continued on page* 105)

Science News-Letter, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address all communications to Washington, D. C.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeograph form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—$5.00 a year postpaid. 10 cents a copy. Ten or more copies to same address, 6 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

Advertising rates furnished on application.

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PHYSICS

Lamp Tells Sound Speed

The blinking of a red neon light is the index by which physicists can measure accurately for the first time the speed of sound waves in liquids. This has been accomplished by Dr. John C. Hubbard and Alfred L. Loomis, working in the latter's private laboratory at Tuxedo Park, N. Y. It is one of the side products of the researches by Dr. R. W. Wood, of Johns Hopkins University and Mr. Loomis on "super-sonics," waves similar to sound waves, but vibrating many times too rapidly to be detected by the ear.

In the new apparatus, which is to be described by the experimenters in the English scientific magazine *Nature*, and is called a "Sonic Interferometer," these same super-sound waves are used. A disc cut from a crystal of quartz, like that used in modern radio stations to keep the wave length constant, only much larger, furnishes the waves. This disc is placed between two metal plates which are connected to a vacuum tube also like that used in radio broadcasting. The tube furnishes a rapidly oscillating electric current. However, while two kilowatts of electrical power were used to run the tubes in the earlier experiments, the sonic interferometer uses only 50 watts, about the same amount of power as used by an ordinary electric light bulb.

When the current is turned on the quartz crystal oscillates, giving off waves which vibrate from 200,000 to 400,000 times a second and from an eighth to five-sixteenths of an inch in length in a liquid medium. The human ear can not hear sounds which are in faster vibration than about 20,000 a second. The middle C on the piano vibrates only about 256 times a second, and the waves from it are about four feet in length.

A vessel containing the liquid to be tested is placed over the vibrating crystal and the waves travel up through it. Immersed in the liquid, parallel to the quartz plate is a metal disc which can be moved up or down by a very small amount. At certain positions of the upper disc, the waves from the quartz are reflected back so that they are exactly in step with the waves coming up from the bottom. In such positions the little neon lamp goes out. By measuring the position of the upper disc, the lengths of the waves can be determined to within a twenty-five-hundredth of an inch. The number

(*Just turn the page*)

ASTRONOMY

HARLOW SHAPLEY

Cluster Specialist

A Missourian should make a good astronomer, for both demand to be shown. In the case of Dr. Shapley, one has, for he has not only shown himself but others. One thing that he has shown the astronomical world is how to find the distances of certain astronomical bodies so far away that they are beyond the reach of ordinary distance measurements.

Some years ago Miss Leavitt, of Harvard, found that in a certain peculiar kind of variable star, exemplified by delta Cephei, the average brightness could be computed if the period of variation was measured. Taking this discovery, Dr. Shapley worked out the important "period-luminosity" law. By means of this law, if any star cluster contains a Cepheid variable which can be quickly recognized, we at once have a means of finding its distance.

Dr. Shapley himself applied this to the globular star clusters, great spherical swarms of myriads of stars, and showed their distances. And in the last few years Dr. Hubble, of the Mt. Wilson Observatory, has applied it to finding the distances of the spiral nebulae, and showed that they are systems like our own Milky Way system, but far beyond its borders. So far, in fact, are they, that their light takes millions of years to reach us.

Nashville, Mo., was the place where Dr. Shapley first saw the light of day on November 2, 1885. He graduated from the University of Missouri in 1910, took a master's degree there in 1911 and then went to Princeton. Here he studied under Prof. Henry Norris Russell, one of the greatest of

(*Just turn the page*)

ASTRONOMY

Mars' Canals Not Man-Made

By ROBERT J. TRUMPLER

Dr. Trumpler is astronomer at the Lick Observatory of the University of California and has made extensive observations of Mars with the great 36-inch refracting telescope of the Lick Observatory, the second largest in the world. In the following article he gives the latest scientific opinion of the Martian "canals."

The so-called canals of Mars have attracted great interest among astronomers as well as the general public because the claim was put forward by some observers that they must be artificial, a sign of the existence of intelligent beings on Mars.

At the close approaches of 1924 and 1926 I undertook a careful study of the surface of Mars by photographic and direct visual observation with the 36-inch refractor of the Lick Observatory. These observations confirm the existence of a general net-work of dark lines and spots on Mars. They contradict the view of former observers that these lines are narrow, uniform, straight canals arranged in regular geometrical figures. This net-work was found to cover the whole surface of Mars, not only the yellow-orange areas thought to be deserts, to which the canals have formerly as a rule been confined, and it exhibits, after all, not much regularity, the marks being densely crowded in some regions and sparsely distributed in others.

The lines themselves are not of uniform canal-like character, but show a wide variety of formations from faint narrow lines to diffuse dark bands, several hundred miles wide. Even the same line may change in width intensity and definition along its course and a few cases were noted in which such lines break off or run out before reaching an end point. No impression of artificiality is conveyed by this network, but it seems perfectly feasible to interpret it as a natural topographic feature of the planet's surface.

It is true that many lines appear straight on shorter or longer stretches, but the difficulties of observation have undoubtedly the effect that the observer tends to overlook small deviations and to over-emphasize the straightness. Even if many of the network lines follow parts of great circles, the shortest distance between two points on a sphere, this does not speak against their natural origin. A comparison of the Moon and the Earth gives a vivid illustration of how dissimilar the surface formations of planetary bodies may be. As Mars differs in many respects

(*Just turn the page*)

Mars' Canals

(*Continued from page 99*)

(size, mass, force of gravity at the surface, scarcity of water, density of atmosphere) from the Earth and the Moon, it can hardly be surprising that its surface should also have a different topographic structure.

Our lack of knowledge about the geologic formations on Mars does not at present permit any definite conclusions as to the kind of topographic features with which the network should be identified. The close relationship between the network and the extended dark areas of Mars which are of a bluish-green tinge suggests the hypothesis that both are made visible by vegetation and that the network-lines represent lanes of greatest fertility: perhaps depressions in the surface, valleys, in which more moisture accumulates, or perhaps faults or cracks of volcanic origin offering exceptionally favorable conditions to plant life.

If we reject the network of Mars as a sign of intelligent life, this, of course, in no way affects the possibility of our neighbor planet being inhabited. It simply puts any discussion of this subject in its proper place, in the realm of speculation on questions of which we have no definite knowledge.

Science News-Letter, August 13, 1927

The life of a chimpanzee in its native surroundings is about 20 years.

Auto tires wear out faster on rear wheels than on front wheels.

Several hundred kinds of flowering plants and ferns have been found in the north polar region.

Houses in modern Egyptian villages are still built of bricks very like those used over 5,000 years ago.

Pneumatic tools are being used to clear away the hardened mud in which the Italian City of Herculaneum lies buried.

The four months' intensive fight against the European corn borer has resulted in the destruction of more than 95 per cent. of the pests.

The sight of children between three and six years of age is being tested at a New York pre-school clinic to prevent eye troubles from developing unrecognized.

Cluster Specialist

(*Continued from page 99*)

living astronomers. He took his doctor's degree in 1914. After seven years at the Mt. Wilson Observatory his ability was so well recognized that in 1921, at the age of 36, he was called to the directorship of the Harvard College Observatory as the successor of the famous E. C. Pickering. Since that time he has amply showed that the choice was a just one.

Science News-Letter, August 13, 1927

News-Letter Features

Born over four years ago of the demand and interest of those individuals who had caught a glimpse of *Science Service's* news reports to newspapers, the SCIENCE NEWS-LETTER has since proved interesting to laymen, scientists, students, teachers and children.

Into the pages of the NEWS-LETTER are fed the cream of *Science Service's* output directed at the newspapers of the world. To this is added material especially prepared.

Turn the pages and note:

It is a *separable magazine.* You can clip or tear out any article without losing or damaging another article on the other side.

Each article is automatically *indexed* by the key word printed above its heading. Articles can thus be filed easily into any system of classification.

Each article is automatically *dated* by its last line.

The current *news* of science, reported for *Science Service* by its own staff and correspondents throughout the world is presented and commented upon in each issue.

Books are *reviewed in brief* as they are received from the publishers.

The classics of science and striking passages from current books, addresses and periodicals are carefully selected and published.

Important *anniversaries* of science are appropriately noted week by week in a special department.

Regular articles tell of the happenings in the *skies* and in the great *outdoors.*

Photographs aid in the telling of the week's science.

Great care is taken to keep its editorial content not only *interesting* but *accurate* as to fact and implication.

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Lamp Tells Sound Speed

(*Continued from page 99*)

of vibrations per second of the crystal is known, and so the speed of the sound waves can be measured with an extremely high degree of precision.

As a result of their investigations, Dr. Hubbard and Mr. Loomis find that the sound waves travel through pure water at a temperature of 60 degrees Fahrenheit with a speed of 4850 feet per second. If the water contains one-half of one per cent. of salt, the speed increases to 5050 feet per second. Increasing the temperature of the pure water to 77 degrees increases the speed to almost the same figure. From previous measurements, the speed of sound in air has been determined at about 1100 feet per second.

According to Mr. Loomis, this work opens a new field in studying liquids, for by no other method is it possible to measure so accurately sound speeds in them. From these speeds can be calculated the compressibility of the liquid and other important facts about its composition.

Science News-Letter, August 13, 1927

The Japanese eat whale meat raw, chopped fine and mixed with vegetables.

Tiles of yellow, brown and blue are being used to pave streets in Sweden.

The Spanish government is encouraging the development of silkworm culture in Spain.

A spider in the Pacific Islands spins a web large and strong enough to be used as a fishing net.

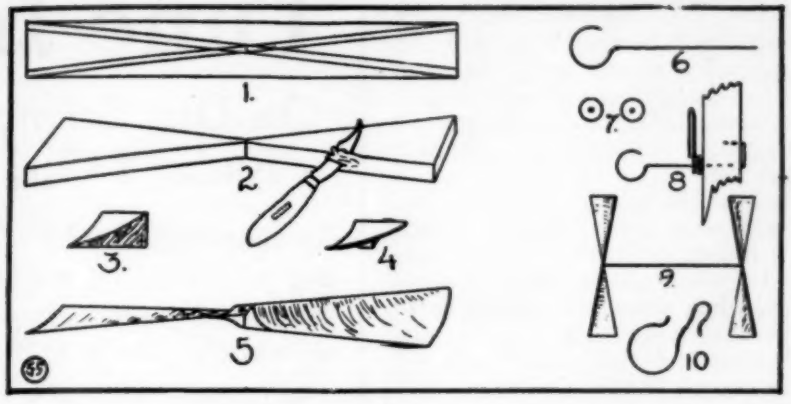
A new automobile carburetor which uses kerosene instead of gasoline has been devised by a Swedish firm.

When tulips were introduced into northern Europe in 1554 there were only two varieties, red and yellow.

A number of new instruments for testing elevator safety devices have been developed by government experts, in order to make elevator operation safer.

A new method of joining steel rails so that they are practically in one piece and yet can move longitudinally with changes in temperature has been reported by a Swedish inventor.

Building and Flying Model Airplanes



Making the Power Plant

This is the second of a series of articles by Paul Edward Garber, telling how to make model airplanes. Mr. Garber is in charge of Aeronautics at the Smithsonian Institution.

The power plant of an airplane is a vital part. When I was in the Aerial Mail Service in 1918-19 one of the fellows said: "You can fly with a barn door if you have enough power." That statement was not quite true but it illustrates the fact that the engine and propellers are mighty important.

For our model we will use rubber bands for the engine and for our propellers we will use blades carved from wood. Propellers are interesting things. As a means for propulsion air propellers are older than water propellers. The famous Italian artist and engineer Leonardo da Vinci made an aerial propeller way back in the fifteenth century before America was discovered, whereas John Stevens of this country was the first to adopt the screw propeller for steamboats a generation after the United States became a republic.

Many kinds of air propellers have been invented. Da Vinci's looked like a spiral staircase covered with cloth. The most modern kinds are thin knife-like blades made of steel. For our model we will adopt a kind that is easy to make, and we will follow the pattern of Samuel Pierpont Langley, who developed the first airplane in the history of the world to make a sustained flight under its own power. His airplane was 14 feet span, too small to carry a man, but it showed that flight was possible. That was way back in 1896. His airplane flew nearly a mile with propellers like these. I hope your model will fly as far. Perhaps it will.

The following material is needed for the power plant:

2 propeller blanks, pine wood, 8" x 1¼" x ¾".

2 hatpins.

4 No. 16 washers or dress spangles.

48 feet of ⅛" flat rubber thread, or of linked rubber bands.

We will use two propellers, one turning the way a clock goes, and the other turning left-handed, both are to blow the air away from the model. For material procure two blocks of wood, 8" long, 1¼" wide and ¾" thick. On the ends make a mark ¼" from the sides. On the top, draw lines from these marks to the opposite corners, as shown in the drawing. Now, saw from the corners to the center, and when all four cuts have been made you will have a shape like that shown in Figure 2. Next drill a hole in the exact center. This can best be done with the drill you used for the bearings, but as a substitute you can use the hatpin heated red hot. When the hole is made balance the propeller blank. Make sure that it swings level. If it does not, cut away the heavy side until it does. After it is balanced, commence carving out the blades. Begin as shown in Figure 3, and cut away that face from the left top edge to the right lower edge, cutting more in the conter so as to slightly cup the blade as illustrated in the end view Figure 4. Cut both blades, and then again balance the propeller. Next turn it over, and cut the backs of the blades. They should be made thin, so that as you hold them up to a light you can see a slight pinkness. Make the blades gradually thicker toward the hub, but have them of uniform thinness for the outer two-thirds of the blade as shown in the end view of the finished blade, Figure 5. When both backs are cut again balance the blade, taper off the hub, and smooth the blades with sandpaper. The left-handed propeller is cut in the same manner, but when starting cut on the left side of the blank, from the right top edge to the left lower edge. This

(*Just turn the page*)

PSYCHOLOGY

A Wineglassful of Brains

A wineglassful of brains—a very small wineglassful—is all that separates the average intelligent man from the fool and the social misfit.

So declares Prof. C. Wingate Todd of Western Reserve University. To be scientifically accurate, the intelligent and successful man averages 1500 cubic centimeters, or a little more than three pints, inside his cranium, while the unintelligent down-and-outer runs about 1480 cubic centimeters. The wide difference in results, he remarks, is obviously a matter of the quality rather than the quantity of these last few spoonfuls of gray matter.

Writing in *Science*, Prof. Todd tells of a grim sort of skull barometer of hard times and prosperity which he and his associates have kept for several years, using the cadavers of unknown paupers turned over to the medical school by the public authorities of Cleveland:

"The average among Cleveland's social ineffectives from 1913 to 1917 was quite constantly within 10 cubic centimeters of 1,480 cubic centimeters. This difference made no impression upon us until in 1918 a strange thing happened. Our average fell to 1,410 cubic centimeters. Now during that year none but the veriest fool was left destitute: the others were all in the army or earning good wages in civilian life. But in 1919 when, after the armistice, industrial stagnation set in and threw out of work many who had recently found jobs; and when, moreover, the disbanding army disgorged a glut of men upon a society which could not immediately absorb them, the average brain volume of our social failures rose to 1,520 cubic centimeters.

"That looked serious to us and

(*Just turn the page*)

METEOROLOGY

Size of Raindrops

A raindrop that falls on your nose is probably so small that three hundred and twelve of them laid side by side only make an inch. At least this is true of the average Irish raindrops.

The measurements were made by J. J. Nolan and J. Enright, both of University College, Dublin. A total of 3,026 drops were measured and more than 180 were 1/312 of an inch in diameter. The largest, of which less than 20 were found, were about ten times this diameter.

Wineglassful of Brains

(*Continued from page* 101)

with great interest we read the prognosis of bankers and captains of industry regarding the future. According to prediction the situation improved in 1920 and our mean brain volume sank once more to near the pre-war level. But the feeling of satisfaction soon gave place to apprehension, for the second and much worse industrial depression set in, distress growing steadily more acute during the months of 1921. Day by day, like obscene demons from the pit itself, we chalked up the rising score until it reached the appalling level of 1,550 cubic centimeters.

"Here was a new class of men entering our portals and they came by a different route. Here were the men who could think for themselves, who knew and resented their fate. The pneumonia of the shiftless, the tuberculosis of the over-wearied struggler, the heart disease of the adventurer no longer acted alone as our receiving agents. Instead men shot themselves, or each other, threw themselves into the lake; poisoned themselves with morphine or raisin jack; perished of cold, listlessly lost in despair.

"And then, suddenly as it had begun, these expectant ghouls in anatomy saw the barometer of brain volume begin to fall, steadily, steadily down. Relief had come: though it was not apparent to the city we knew the end was in sight. Hope was restored again in those whose nervous systems had been shattered by defeat. Never again have we seen the like. Slight fluctuations from year to year and an average somewhat above the pre-war mean have been our lot but never that alarming rise which we experienced in the year of intense depression."

Science News-Letter, August 13, 1927

Isa Lake, in Yellowstone National Park, in the spring sends part of its waters to the Pacific Ocean and part to the Atlantic.

Martin Johnson, well known African explorer, plans to return to the Congo for the chief purpose of photographing gorillas.

Plans are being formed to build a new international bridge across the St. Lawrence River at the eastern end of Lake Ontario.

Model Airplanes

(*Continued from page* 101)

balancing is very necessary; the blades should balance level and the two propellers should weigh the same and be the same shape and size throughout. If this is done and all other factors are true the model will fly straight.

The propeller shafts are bent from the stiff wire of the hatpin to the shape shown in Figure 6. The hook must be round and in line. In other words, when the shaft is twirled between the thumb and finger, the hook must look like a circle and not like an egg. If the wire is too stiff to bend or if it snaps off when bent, it must be heated red hot and allowed to cool, after which it will be softer and more easily worked. When the shafts are made, insert them in the propeller hubs and turn the end back into the hub to secure it as shown in Figure 8. Figure 7 shows two washers to be used to reduce friction between the propeller and its bearing. They can be bought at hardware stores and are shown as number 16 washers. Dress spangles will do also. There may be some of these in your house on an old dress, or if not, notion stores carry them. Two of these are put on each shaft, after which the shafts are put through the bearings as shown in Figure 8. Figure 9 shows how the two propellers are put on the frame. The right handed one goes on the right side and the left handed one on the other. This arrangement makes the model fly highest because the down stroke of the propellers being outside exerts the most leverage. Figure 10 shows a fitting known as an "S" hook. Two of these are required, and are made from hatpins or other stiff wire to the shape shown. They are used to fasten the rubber strands to the nose hook.

Divide the 48 feet of rubber into two lengths. Tie the ends of these lengths together making two large rubber hoops. Loop these hoops twice, forming two hanks of eight loops each. To one end of each loop attach an "S" hook. Pass the other end through the cans on the frame and hang it onto the propelier shaft hook. Put the "S" hook on the nose hook. This completes the power plant.

Next week we will start on the wing.

Science News-Letter, August 13, 1927

Clothes moths do not feed on cloth of vegetable origin, such as cotton or linen.

Tune In

On Our Science Radio Talks!

In cooperation with leading broadcasting stations, Science Service presents a weekly radio talk on "SCIENCE NEWS OF THE WEEK"

These are given from the following stations:

KOAC	Oregon Agricultural College, Corvallis, Oregon.
KUOK	University of Arkansas, Fayetteville, Ark.
WABC	Atlantic Broadcasting Corp., New York, N. Y.
WEAO	Ohio State University, Columbus, Ohio.
WBAO	James Millikan University, Decatur, Ill.
WBET	Boston Evening Transcript, Boston, Mass.
WCAD	St. Lawrence Univ., Canton, N. Y.
WDBO	Rollins College, Winter Park, Fla.
WDOD	Chattanooga Radio Company, Chattanooga, Tenn.
WEBW	Beloit College, Beloit, Wisc.
WGR	Federal Radio Corp., Buffalo, N. Y.
WHAS	The Courier-Journal, Louisville, Ky.
WHAZ	Rennselaer Poly. Inst., Troy, N. Y.
WMAL	The Washington Radio Forum, Washington, D. C.
WMAQ	Chicago Daily News, Chicago, Ill.
WOO	John Wanamaker, Philadelphia, Pa.
WRAV	Antioch College, Yellow Springs, Ohio.

Watch the program of the station nearest you to see what time these talks are given. If no station near you gives them, write us, suggesting any station that you think might give them.

SCIENCE SERVICE
21st & B Sts.
Washington, D. C.

Children's Work at the Brooklyn Botanic Garden

Most botanic gardens in the world offer nothing in specially planned work for children and teachers. It has been the aim of the Brooklyn Botanic Garden to make a definite contribution to the children of its Borough. The work is confined strictly to plant study. Other phases of nature study are only incidental as they appear in our work.

The work may be classified in this way. First: classes for school children. They come with teachers in school time. Second: classes for children on Saturday mornings and vacation periods, and also after school. Third: classes for teachers.

Group I

Work for visiting classes from schools. We give a series of lectures, lessons and field trips on nature study, geography and gardening for school children coming with their teachers in school time. The topics are planned to correlate with the city courses of study in nature study and geography. For instance, if a class is studying South America, it would choose a talk on coffee or rubber or both. Sometimes lantern slides are used, sometimes motion picture reels. The class is presented with syllabi of facts, which have been worked out for the use of the individual child. Then the class will go to the greenhouse to see the coffee or rubber tree growing.

Many classes come for trips about the grounds. In such cases an itinerary is planned. A mimeographed sheet is given to each child so that he may follow the course around the grounds and know exactly what to look for. The child takes it back to the school so that he may review his trip and make it a part of his class work, or at least make it a part of his own distinct memories.

Some schools ask to have classes come regularly once a week for a series of weeks for a definite set of lessons. Requests come for work in the school auditoriums along just the same line as that carried on at the Brooklyn Botanic Garden. The stress is placed on urging classes to come here because of the natural facilities of grounds and greenhouses, and because we desire the children to become acquainted with this civic plant of theirs.

Group II

In the second group the Brooklyn Botanic Garden conducts a little school of education in nature study, greenhouse work and gardening. From 185 to 225 children attend every Saturday of the year with the exception of Saturdays in January. In the fall the work is based upon fall nature study, the raising of bulbs, cuttings and Christmas plants, working in the greenhouses. Sometimes it includes basketry. This work ends with Christmas season. During the month of January the older boys and girls come back for some special piece of work, a privilege open only to the older ones.

In the spring the work is based entirely upon the outdoor garden. The children raise seedlings, get acquainted with the seeds, the soil and various other steps in gardening work before they go out into the outdoor gardens. The outdoor garden offers of course first an opportunity for educational work, and is not merely a place to raise vegetables and flowers. The children learn not only nature's ways but lessons in self-control, straight thinking, and proper appreciation of what the beauty in life means.

These children who come in this second group come because they wish to come and are chosen on these grounds. They pay some nominal fee in order that the work may seem entirely theirs. They have their own organization called the Boys' and Girls' Club of the Brooklyn Botanic Garden, and their own paper, which they edit and publish, called the "Agricola." The different stages of progress by which they win their honors and medals and pins are conducted so that the unpleasant features of competition are entirely taken away.

Group III

The third group comprises classes for teachers in botany, nature study, greenhouse work, pedagogy of botany, the theory and practice of children's gardens. These classes are held after school, and are arranged to cover a period of thirty weeks so that college credit may be given, if desired. They are also under the Brooklyn Teachers' Association.

There is a little verse from Wadsworth over the children's house which gives the motto of our work with children and teachers, and reads:

"He is happiest who hath power
To gather wisdom from a flower."

Not to gather flowers, but to gather wisdom from a flower.

ELLEN EDDY SHAW, *Curator,*
Elementary Instruction,
Brooklyn Botanic Garden.

Science News-Letter, August 13, 1927

The material on this page is furnished by the Coordinating Council on Nature Activities.

Star Games

There is more than one way of skinning a cat, and more than one way of interesting children in Nature Lore. These Star Games go further in that direction than hours of lecturing.

ACTIVE STARS: The players stand in a circle with leader. Leader displays diagram of constellation (white stars on black paper is best) and says, "Simon says this is Cassiopeia." If this is right, they jump and clap hands above their heads; if wrong, they stand silent. If "Simon says" is omitted by the leader and the balance of the statement is correct, they try to get card with constellation. If "Simon says" is not omitted, but statement is incorrect, leaders and seconds must race around circle. This may be simplified at first.

STAR PICTURES: Each group is provided with fifteen paper stars which are placed at the feet of Number One who has balance of group at his or her back. Leader stands in front and displays diagram of constellation to Number Ones so that no one else may see it. Number Ones go back to patrol and place paper stars to form constellation shown by leader. Number Twos race to leader, name constellation and return to correct any errors in the form of the constellation. Leader may decide which constellation is best. Number Threes race for another constellation and Number Fours name and correct it and so on.

(Later after the constellations in the sky are known—each one can form the constellation called out by the leader.)

VARIATION: Players lined in relay information and leader calls out name of constellation—same number as stars in constellation hold hands and race to front of room and kneel forming constellation. First placed and correct wins.

STAR GRAB: Have cards with constellation on them and place these in their right positions on the floor or ground. The leader calls out the name of a constellation or star and the first player (relay—Number Ones,

(*Just turn the page*)

Star Games

(*Continued from page* 103)

etc.) to seize the correct one secures a point for their patrol.

ALTAIR and VEGA MEETING: Tell story of Chinese legend concerning Altair and Vega, the river of the Milky Way and line players up in two files facing one another and about twenty feet apart. Let players select one from each side to be Altair and Vega. Vega starts from one side and Altair starts from the other. Leader begins by asking Vega's side a question regarding the stars. Number One answers and if correct, Vega takes one step toward Altair. Altair's side is next and leader asks question there. If one side should miss, other side may answer question and let their star take two steps forward. Five questions should be allowed each side (that is, five steps or ten feet), and Vega and Altair should meet—if they do not—game can be closed and "Rain of Tears" continues.

Questions like: 1. Name planets visible at night in this season. 2. Name five first magnitude stars visible this month at night. 3. What three constellations are always visible? etc.

STAR STUNTS: Players can be divided into several groups and given "Sealed Orders" such as:

1. Act out story of Casseiopeia or make up some story that will be original and entertaining.

2. Make up original words to some familiar tune. This song should be woven around the story of the Big Dipper, or the Great Bear.

Each group will draw for turn on program and is given five or ten minutes to prepare stunt.

—MARIE AFTNITH,
Girl Scouts, Inc.

Science News-Letter, August 13, 1927

EVERY Fisherman *Should Have It*

Free Upon Request

Write and get a copy of Pflueger's Pocket Catalog No. 146. It contains just the kind of information every fisherman wants. Besides being a catalog of Pflueger tackle for every kind of fishing—also illustrates and describes leading game fish, habits—haunts—weights—food value—tackle recommended for catching, etc.

THE ENTERPRISE MFG. CO.
Dept. SNL, Akron, Ohio
Oldest and Largest Manufacturers of Fishing Tackle in the United States

PFLUEGERS'
FISHING TACKLE
Leaders Since 1864

Nature Coordination

Realizing the need for a national program that would coordinate the nature activities of national groups working with young people, the American Museum of Natural History invited these volunteer organizations to form a council to be known as the Coordinating Council on Nature Activities for the purpose of teaching the growing generation, through nature activities, the value of all wild life and natural resources and their conservation.

The various organizations represented are as follows:

American Museum of Natural History, American Natural Study Society, Boy Scouts of America, Camp Directors Association, Camp Fire Girls, Inc., Girl Scouts, Inc., Pioneer Youth of America, Playground and Recreation Association, Woodcraft League of America.

Science News-Letter, August 13, 1927

BOTANY

NATURE RAMBLINGS

By FRANK THONE

Two Curious Plants

Everyone who spends his vacation in Yellowstone National Park or anywhere in that general region, will see great quantities of the rayless coneflower. This very curious plant looks more or less like one of the numerous species of wild sunflower or related flowers that can be found anywhere. It has rather coarse, rough stems, from three to five feet high. Its leaves also are rough, broad at the base and tapering to a point. It rather likes moist places, which accounts for its frequent presence in mass in the roadside ditches.

The curious feature about it is the flower, or rather the flower-head, for the plant is a composite, crowding scores of tiny flowers into an apparent single bloom. Only this flower, instead of having a gay collar of petal-like "rays" about it, just sticks up like a little black pine-cone. The main stem and larger branches bear large cones, and the lesser branches bear little ones. One would think that this plant, having so little to attract insects to their task of carrying pollen, might have a hard time of it; but quite the contrary is true, for it is one of the commonest species in the region. Perhaps it depends on underground runners or rootstocks for propagation, or forms its seeds, as many of its relatives do, without pollenation, or it may even be successful in attracting insects without a colored flag. Nobody has given it much study, and the question is still an open one for some enterprising botanist to tackle.

Another curious flower that grows in the same region, as well as in many other parts of America, takes us back to memories of the quaint old drug shops our parents and grandparents knew. Modern drug stores, where you can buy anything from an imitation ivory toilet set to a popular novel, have their advantages; but a generation whose hair is beginning to grow thin on top (in spite of tonics recommended by glib salespeople) remember with regret the "lickrish root" of their childhood, handed out as *lagniappe* by the old-fashioned druggist with every dime purchase. Nothing on the modern candy counter tempts the appetite as did those pungently sweet bits of soft, barky wood that supplied just the right resistance for vigorous and satisfactory chewing.

How many of us knew then, or now, for that matter, that licorice is a plant related to beans and peas? Yet so it is. The licorice of commerce is one of a dozen species scattered around the northern hemisphere, and one of them running down into South America. In many places in this country, especially in the northern Rockies, you will see quantities of wild licorice growing by the roadside and along the bottoms of moderately moist gulches.

It is a densely bushy plant, with lush, dark green foilage, reaching a height of two or three feet. The leaves are somewhat like those of a locust tree, but bigger and coarser. The creamy flowers are shaped individually like narrow pea-flowers, and are densely crowded together in spires that stand up above the mass of leaves.

Science News-Letter, August 13, 1927

TRANSCONTINENTAL ROAD SIGNS. Do you know what the shield indicates? Does the figure 6 mean anything to you?

Traffic Signs

(*Continued from page* 98)

ago. So many conferences, committees and research boards began to work on the problem and to confer together that it is hard to say where the work of one begins and another leaves off. The result of this work is that there is now a good deal of scientific information available, showing how and why certain kinds of lights and paints and lettering carry a message to the eye more quickly and surely than other kinds.

Take the question of colored lights, for example. Obviously some colors are more easily seen than others, but which? Some data on this subject were gathered by Dr. Knight Dunlap, at Johns Hopkins University, under the auspices of the National Research Council. Dr. Dunlap took into consideration the fact that some four per cent. of men and a slightly smaller per cent. of women are color blind, and a great many more are color weak, that is, they have difficulty in distinguishing colors quickly or when their attention is divided. Translated into figures, this means several million people who might have difficulty in distinguishing traffic signals.

"It is advisable for traffic purposes," said Dr. Dunlap, "to treat all persons as if they were color blind in the usual way. These people see only two colors, blue and yellow, where the normal person sees the whole spectrum. Red, orange and yellow appear yellow or brown, and blue-green and blue both appear blue. There is no difficulty in distinguishing any color of the one group from any color in the other, except that pale blue and pink look alike."

Invisible Lights

Green lights used in some towns would appear white to the color blind person, he pointed out, and to some color blind drivers certain red lights in use would be almost invisible.

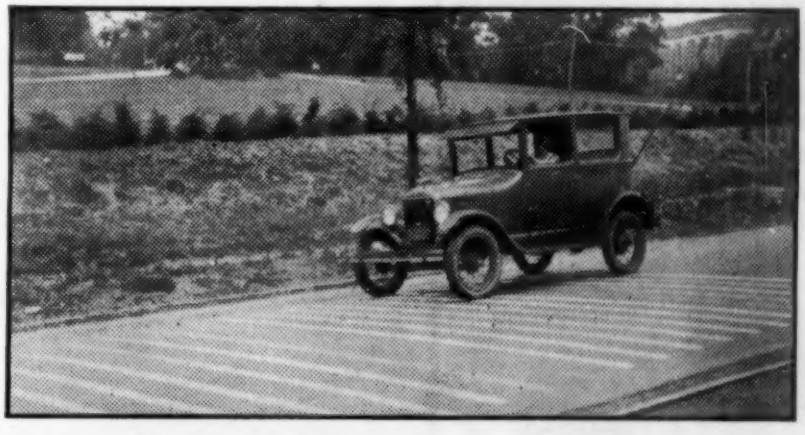
"The automobile driver," he said, "in the very situations where the signals are most important, has to watch other machines and pedestrians at the very moment when the signals are effective, and must frequently see the signals in indirect vision, that is, not looking directly at them but with the eyes directed more or less in another direction. Unfortunately, the 'normal' eye is color-blind at certain angles of indirect vision, and color-weak even at lesser angles. That is, at certain angles of vision, the normal man has just the same difficulties in distinguishing colors as the color-blind or color-weak man."

Orange-red light for stop and blue-green for go (the bluer the better) are the two signals which are most clearly distinguished for traffic purposes, Dr. Dunlap stated. Yellow light, if used at all for caution, should be a flashing signal.

In the code of colors and forms for traffic signals approved by a sectional committee of the American Engineering Standards Committee, the red-orange and blue-green glass, made according to a set formula of color ingredients, are now set down as standard.

The wisdom of using a yellow

(*Just turn the page*)



TRAFFIC IS HARD ON WHITE PAINT. Here are a dozen paint samples taking a street test in front of the U. S. Bureau of Standards

Traffic Signs

(*Continued from page* 105)

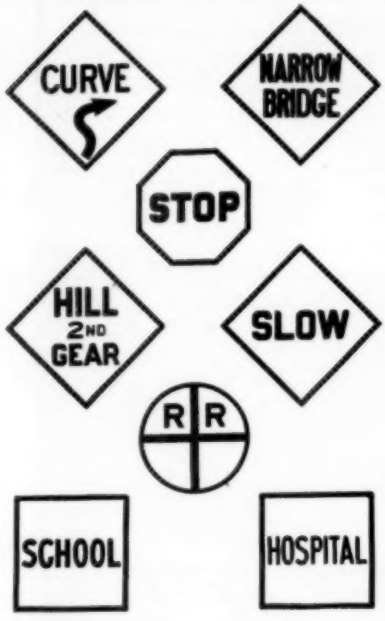
light to clear a crossing when the red and green lights change is now being questioned, even apart from its bearing on the problem of color-weakness. Dr. M. G. Lloyd, electrical engineer at the U. S. Bureau of Standards, states that a third color seems to be unnecessary for this purpose.

"Use of the yellow light has been discarded in New York City, and I am inclined to think it might well be dispensed with in other cities," he said. "The display of red in all directions will stop vehicle traffic in favor of pedestrians, and the same combination exposed for a few seconds would serve to clear the crossing of one stream before the green signal is displayed to start the other.

"Similarly, if it is desired to stop traffic in all directions upon the approach of fire apparatus, red will do this just as effectively as yellow, or more so, and if a special indication of the condition is necessary the red can be changed to a flashing signal or a siren sounded in addition. Use of yellow for this purpose has a disadvantage; that is, its first appearance is usually interpreted as being a transition signal, and drivers actually get started when it is the intention to hold them stopped."

Light Without Electricity

Colored lights have been introduced to some extent in warning signs along highways because the illumination is more striking than flat paint, especially at night. In recent glass lettered signs, however, the effect of light is obtained without use of electricity. The back surface



THE BLACK LETTERED SIGNS on a pale yellow background all shout one message—"Caution"

of this glass is molded at such angles that it reflects the light from head lamps back to the driver even when he looks at it from an angle. These glass lettered signboards are being used as caution signals along highways, and also have begun to be used in cities as stop signs at the entrance to a boulevard. These stop signs are usually a red background with the glass letters in white.

Except for red lights, red, the color of danger, is not playing so large a part in traffic sign language as might be expected. This is chiefly because the red does not stand out prominently as a color at night.

Black lettering on pale yellow has been found to be the most effective contrast and black lettering on white is also easily read. Incidentally, experiments along this same line show that dark letters and figures on a light background make more legible automobile license plates than light colored letters on a dark ground.

The best height for signs from the ground, so that they can be read by the light of head lamps has been tested, and it has been found that many signs are placed too high from the ground. It has also been set down as a serviceable rule that warning markers at crossroads or curves should be 200 to 300 feet in advance.

Result of some of the testing and planning are found in the set of signals developed by state highway officials and federal highway experts for the U. S. highways, which consist of 96,000 miles of transcontinental highways and roadways connecting with them.

Twenty-four states have marked out the sections of these roads that run through their territory, according to the new system, and the rest expect to follow suit when details of local arrangements are completed.

Numbers Instead of Names

Along these roads, which cross the country in every direction, will be found shield-shaped signs marked U. S. with a number below the letters. The number on the shield is the key to the identity of the road, and conveys a good deal of information to the person who is familiar with the system. All odd numbers, for instance, mean roads running north and south. Even numbers indicate east and west roads. Route one starting in Maine runs through to Florida. Route 101 parallels the length of the west coast. Number 40 is a cross country mid-continental route from Atlantic City to Baltimore and thence across to Denver and San Francisco.

Aside from route 101, all three-digit roads are cross-over roads leading to the main routes. The individual who finds himself on a road marked 140 or 240 will, by traveling in a westerly direction find himself eventually meeting main road number 40.

Naming roadways has proved confusing to travelers, and that is why these routes have been numbered and no attention paid to the names of the highways with which they may coincide. In Mississippi there have been seven Jefferson Davis Highways. In Montana one road has had eight different names, all of them in local use. The U. S. highway system coincides in some sections with the Lincoln Highway and other well known routes, but none of the cross country routes fits exactly with the named highways.

These 96,000 miles of standardized road are being marked with a simple set of caution and direction signs. Black letters on white ground are reserved for information and direction signs, on rectangular boards or on arrows. Black letters on a lemon-colored background means caution regardless of the exact wording of the sign.

Yellow for Danger

On these yellow signs the degree of the hazard is indicated by the shape of the signboard. A round

(*Continued on page* 107)

Blue Band
VELVET
PENCILS
Used by millions
5¢
At all dealers
VELVET
The Lead has special strength with perfect smoothness and softness, is very black, yet it is readily erased.
The Rubber is of the famous Venus quality.
The Costly Wood is a specially selected cedar, treated to give best satisfaction in sharpening.
The Walnut Finish and Blue Band make it easily recognized.
Write for Sample
AMERICAN LEAD PENCIL CO., 218 FIFTH AVE. N.Y.
Makers of the famous VENUS Pencils

Traffic Signs

(*Continued from page* 106)

yellow marker is reserved for railroad crossings. A diamond-shaped marker means slow down, and this general message of the diamond can be read before the driver comes within reading distance of the words curve or hill. An octagon sign means stop. And a square sign indicates a school, hospital, or other situation which may require a little more than ordinary care on the part of the passing driver.

Some progressive cities have begun to adopt this method of conveying an idea by color and shape as well as by the words on a sign In Washington, stop signs at the entrance to boulevards are now made octagon shape, in accordance with the system on the U. S. highway routes. But so recent is this idea that the majority of local drivers have not appreciated that the form of the sign has any particular significance.

This use by a city of one of the new highway devices shows how a really uniform sign language will fit into cities as well as country roads. A model city traffic code, which includes provisions for signals and signs, is in process of development to show local traffic officials how nationwide standardization can be effected. It has been stated that the New Jersey legislature will probably take the lead in putting such a model code into practical city use, once an agreement on details is reached by the experts formulating it.

Questioning the Cities

To find out what the cities are doing, and just how much difference there is in local practices, the American Engineering Council has sent out questionnaires to local committees in 125 cities with a population of more than 50,000, and also to 75 additional selected cities where special conditions exist. These questionnaires will show how electric traffic signals are used, what sort of caution and stop signs are used, how tall the letters on them are and what colors and kinds of paint, wood, and metal are considered satisfactory, and so on until a large collection of valuable information regarding traffic materials and devices is set down for study by statisticians and engineers.

The Highway Research Board, which was organized under the National Research Council to coordinate the results of highway research throughout the country, points out

(*Just turn the page*)

GEOLOGY

Vesuvius Rumbles

Vesuvius, which is reported restless is not yet dangerously active, volcanologists believe, though the time for a serious outbreak may be approaching.

Following the last great outbreak of Vesuvius, in 1906, several hundred feet of the summit were blown off and the crater was widened and deepened. The new crater, with a depth of 1,200 feet and very steep sides, slowly began to fill up again, and a small interior cone began to build.

Dr. Henry S. Washington, of the Geophysical Laboratory of the Carnegie Institution of Washington, who has visited Vesuvius many times and took part in a special study of its last great eruption, states that the lava level has been rising until it is very near the rim.

"Vesuvius, however, seldom sends lava flows over the rim of the crater," he states. "Usually they break out on the sides of the mountain, accompanied by the eruption of vast clouds of smoke and ashes."

Vesuvius spouting lava is a sight of wonder, but to thousands of people who live within its reach, and to the archæologists who are digging out the old city of Herculaneum it is a menacing spectacle. News from Vesu-

(*Just turn the page*)

PHYSIOLOGY

Heat from Heart Beat

A quite normally beating heart, like an automatically equipped storage battery, "discharges" and "recharges" within the period of each beat. From his researches on the hearts of turtles and king crabs, at the Johns Hopkins University, Dr. Charles D. Snyder and his associates have found that even a single beat of the heart will produce heat in proportion to the energy expended.

"This explains at last," Dr. Snyder declared, "the wonder of the heart's great regularity, its constant vitality and the age long mystery of its indefatigability."

In their experiments every precaution was taken to exclude heat from outside sources. The hearts of turtles and king crabs were used because they will keep beating a long time after the animal itself has been killed. A small thermos jar was placed inside a larger one and in the cap of the smaller jar were fixed hard rubber posts to which the muscles were attached. Through the cap were perforations for the wires connecting the thermopile with

(*Just turn the page*)

BOTANY

Rubber for United States?

Rubber raising in the United States, a project which enjoyed a renewal of public interest following Thomas A. Edison's recent visit to Washington, is at bottom a problem of the relation of plants to climate. If Edison's hopes of establishing rubber plantations in the United States are to be realized, either hardy forms of the present rubber-yielding plants of the tropics will have to be evolved, or certain rubber-yielding plants native to the temperate zones will have to be bred up to a point where their rubber content will pay for its own extraction.

All the present rubber trees and vines are warm-climate plants. The Para rubber tree, *Hevea,* which now produces by far the larger part of the world's crop on the East Indian plantations, is decidedly a tropical form. It will just consent to grow in southern Florida, but will not grow for money unless it is permitted to hug the equator. It is out of the question for the United States proper, though it would thrive in the Canal Zone and the Philippines.

The original "India rubber" of the Orient was the product of a species of fig, the same tree used as an ornamental in thousands of apartments, and in larger size as a display piece in many greenhouses. This tree is slightly hardier than the *Hevea,* but is still very sensitive to frost, and could hardly be expected to pay its way even in the South unless new

(*Just turn the page*)

PSYCHIATRY

Mental Disease in Children

An appreciable increase in the number of young people who fall prey to mental diseases is found by Dr. Menas S. Gregory, head of the psychiatric department of Bellevue Hospital.

People are more enlightened about the danger of letting mental and nervous ills gain headway, and as a result more youthful cases reach the hospital, he says, but this does not fully explain the increase.

"The higher standards of the present day are largely responsible," he states. "The demand for material luxuries is greater today than it has ever been. The longings of youth are more intricate, more difficult to attain. They are more likely to be thwarted. And an increase in thwarted longings and ambitions makes for an increase in abnormal mental and nervous states."

Rubber in U. S.

(*Continued from page* 107)

varieties better adapted to our climate can be produced.

Perhaps third in present importance as a rubber producer is the Madagascar rubber vine, related to our milkweeds, which Mr. Edison is now trying out in the South. Even in the tropics, it now produces only a small fraction of the world's rubber, but it might be exploited more advantageously by plantation methods and with more modern means of extraction than those now practised in its native home.

In our own semi-arid Southwest, and more extensively in the adjacent states of Mexico, there is a native bush, the guayule, which contains rubber in paying quantities. It has the distinction also of yielding its rubber as tiny bits of the pure substance, not as a milky juice or latex which has to be given complicated and expensive treatments before it can be used. Guayule is now being cultivated by a corporation which has a larage plantation in southern California, but even this native rubber plant requires the desert heat for profitable growth and holds out little hope of becoming adapted to the colder North.

There remain native plants like the milkweeds and dogbanes, which yield a milky juice containing a little rubber or rubber-like material. These are perfectly hardy in the North, and very prolific—frequently too prolific from the point of view of the farmer. But their content of resilient gums is so low that it would be a bold undertaking to try to make them into commercial sources of rubber, even with the best methods now at the disposal of the plant breeder.

Science News-Letter, August 13, 1927

Ants are fond of the nectar in flowers.

The highest pitched musical instrument is the piccolo.

One-tenth of the world's crops are eaten up by insects.

A baby Indian elephant stands about three feet high.

An insect with wings is an adult and will not grow larger.

Numerous deaths of western wild fowl are puzzling biologists.

Vesuvius Rumbles

(*Continued from page* 107)

vius indicates that Herculaneum is not in danger, Dr. Washington believes, but the important archæological work that is going on there is attracting attention to the situation, and if a new layer of mud should roll down from the volcano, the long awaited excavation of the city might be still further delayed.

In 79 A. D., when Pompeii was buried n 15 feet of ash, Herculaneum, which is several miles closer to Vesuvius, was smothered in from 30 to 70 feet of mud. Six more eruptions buried deeper, and the mud hardened into stone. This stone is now being systematically attacked with pneumatic drills by Italian archæologists, and in less than three months of work they have made encouraging progress, unearthing a street 80 feet below the surface, revealing walls and columns of shops and houses.

The hardness of the stone in which the city is buried has hitherto baffled scientists. Small portions of the city, laboriously unearthed from time to time, have showed that Herculaneum contains remarkable works of art and perhaps the most complete remains of a Roman city anywhere preserved, all of it closely encased in the strange packing of stone.

Science News-Letter, August 13, 1927

Heat from Heart

(*Continued from page* 107)

the galvanometer for recording heat and for a thread connecting the muscle with a lever outside that recorded the tension. The desired temperature in the inner jar, usually 1 to 3 degrees Centigrade, was maintained with ice. The sensitive thermopile, or heat detector, was placed in close contact with the surface of the muscles, and both heat and tension were finally recorded on a moving photographic film.

It was found that the heart of the king crab produced on the average 71 millionths of a calory per centimeter of length for each gram of tension exerted and that the ratio of heat produced to the tension exerted per gram of weight of muscle was fairly constant throughout the series of experiments.

Science News-Letter, August 13, 1927

The average 20-year old Japanese woman today is two inches taller than the average of 20 years ago, while the height of Japanese men has increased one inch.

Traffic Signs

(*Continued from page* 107)

that highway safety is primarily an engineering problem, but it is considerably influenced by the human factor.

Prof. S. S. Steinberg, of the University of Maryland, who is assistant director of this board, says that "a recent statistical study of the distribution of blame among factors involved in highway accidents, has shown that the 'human factor' is responsible for approximately 90 per cent. of motor vehicle accidents and that causes attributed directly to defects in the highway or the vehicle are of small relative importance. Loss of some 25,000 lives annually, the injury of several times that number, and the enormous property damage have focused the attention of many agencies upon this grave problem of highway safety."

So far as the signs on street and road are concerned, this human factor is a complex item which is only beginning to be given full consideration. Most of the signs which rise up to confront the passer-by can be read and understood by any one who gets close enough and looks them over. Many of them are good enough for the automobile driver with keen eyesight and an alert mind. But this is not enough, it is now recognized, so long as there are several million color-blind people, several million with eye defects, the illiterates, and nobody knows how many million that react just a little slowly when they are tired or worried or distracted. For such people a few seconds delay in grasping the message of a sign means the difference bewteen safe steering and a wild effort to bring a car under control in time to avoid danger. It is because of the complex human factor that engineers are now saying that the sign language should be as fool-proof as possible, and so simple and uniform that everybody can read it—and read it fast.

Science News-Letter, August 13, 1927

Tobacco demands more work per acre than any other big crop in this country.

Few alligators live a natural lifetime because of the demand for their hides.

An electric machine that counts coins at high speed is used in the Bank of England.

First Glances at New Books

THE NEXT AGE OF MAN—Albert Edward Wiggam — *Bobbs-Merrill* ($3). A forward looking book which takes stock of man's present status, economically, culturally, eugenically, and sees hope for the future. "Surely," says Dr. Wiggam, "man can make use of the intelligence which evolution has given him to influence that evolution of the future, just as he now puts other laws of nature to the uses of his intelligence and will."

Science News-Letter, August 13, 1927

THE RELIGION CALLED BEHAVIORISM—Dr. Louis Berman—*Boni and Liveright* ($1.75). Dr. Berman starts out dramatically with the assertions: "Chrstianity is dead, Judaism is dead, Mohammedanism is dead, Buddhism is dead, for all spiritual purposes. . . . Slowly but steadily a new, a powerful religion is growing into maturity in the United States as a result of a new psychological movement. It calls itself Behaviorism. It might be called Watsonianity." Student suicides and other mental maladies of the day he ascribes to the spread of materialistic and mechanistic philosophies like Behaviorism. He sees salvation to society only in the introduction of the Gestalt psychology. His advice to the patient is: "configurate with the universe."

Science News-Letter, August 13, 1927

ANCIENT CITIES AND MODERN TRIBES — Thomas Gann — *Scribner* ($5). Dr. Gann brings us up-to-date on the archæological discoveries lately made in this corner of America and even lets us look forward to the possibility of more wonderful finds —forerunners of the Maya, perhaps even Americans of the Old Stone Age, and the long sought books which were buried with the Maya priests and which would be a veritable Rosetta Stone to unlock the written speech of these people.

Science News-Letter, August 13, 1927

PHOTOGRAPHY—Alfred Watkins—*Van Nostrand* ($4). A standard treatise on photography, now revised by the addition of sections on amateur cinematography, aerial photography, etc.

Science News-Letter, August 13, 1927

DIELECTRIC PHENOMENA — S. Whitehead—*Van Nostrand* ($4). A complete and authoritative work on electrical discharges in gases.

Science News-Letter, August 13, 1927

SCIENCE: LEADING AND MISLEADING—Arthur Lynch—*Dutton* ($3). A British psychologist examines the foundation of modern science, and prods at all the cardinal dogmas to see whether they are solid or just stuffed. His remarks are pertinent, and frequently pert as well. If you happen to dislike somebody with a vogue—Freud, for instance—you will get a lot of "kick" out of the book; if, on the other hand, you are devoted to a favorite master or "school," the mental liver-jolting may do you a lot of good.

Science News-Letter, August 13, 1927

IN UNKNOWN ARABIA—R. E. Cheesman—*Macmillan*. The travels and adventures of a British soldier-naturalist in eastern Arabia. In addtion to the frequent references to the wild life of the regions traversed in his journey, the author gives in a series of appendices his collection notes covering all forms of animal and plant life, geological jottings and meteorological observations. He seems to have taxed his territory for every scrap of information it would yield.

Science News-Letter, August 13, 1927

SPEECH: ITS FUNCTION AND DEVELOPMENT — Grace Andrus de Laguna — *Yale University Press* ($5). A comprehensive volume, dealing with speech in its evolutionary, psychological, and philosophical aspects, with the particular aim of considering the function of speech in society and its function in the life of the individual.

Science News-Letter, August 13, 1927

APPLIED PSYCHOLOGY—A. T. Poffenberger—*Appleton* ($4). An excellent text, dealing in detail, first with efficiency, thinking, fatigue, suggestion, and other human factors, then with environmental factors such as ventilation and distraction, and finally with the application of psychology to many different activities.

Science News-Letter, August 13, 1927

THE HARVEST OF THE YEARS—Luther Burbank, with Wilbur Hall—*Houghton-Mifflin* ($4). A sympathetic interview-autobiography of the great horticulturst, which has lately been appearing in serial form.

Science News-Letter, August 13, 1927

THE LURE OF THE GREAT SMOKIES —R. L. Mason—*Houghton-Mifflin* ($4.50). An account of the interesting mountains of the Tennessee-Carolina border and of their still more interesting inhabitants.

Science News-Letter, August 13, 1927

ARCHÆOLOGY

Maya Writings Sought

Quotation from ANCIENT CITIES AND MODERN TRIBES—Thomas Gann—Scribner.

To the archæologist, however, the cave (the cave of Loltun near Coba, Mexico) is naturally of even greater interest, as here, if anywhere, will be found traces of man, if man existed in Yucatan, before the coming of the Maya in the early centuries of the Christian era.

Some little excavation has already been done beneath the earth covering the floor of the cave in the immediate vicinity of the Loltun openings, where traces both of burial and occupation by the Maya during the New Empire are to be found in great abundance; but the petroglyphs, both at the Hunacab and Loltun mouths, afford us this information at the first glance, and I am convinced that it is in the remoter fastnesses of the cave, as yet entirely unexplored, that discoveries may be made, not improbably of a pre-Maya race, or possibly even of palæolithic man, such as have been made in France, Spain, and Palestine, for if traces exist anywhere on the American continent, surely such a vast natural cavern as this would be the place to look for them, admirably adapted as it is either as a mausoleum or dwelling-place.

Moreover, here, if anywhere, might be discovered the anhaltes, or ancient books of the Maya, dealing with their history, calendar system, and religion, all but three of which were burnt by Bishop Landa after the Conquest as works of the devil.

We know from contemporary historians that these books, made of the fibre of the *Agave americana*, or American aloe, were buried with the priests, but up to the present not one has ever been discovered, probably owing to their complete disintegration in this warm, damp climate. Yet it is the dream of every Maya student's life to find one of these historical codices, which should not only supply a history of this wonderful people for probably two thousand years before the arrival of Europeans on the American continent, but, by affording a key to the unknown glyphs, act as a Rosetta stone to the monoliths, and enable us to read the records of the individual cities, their rise and fall, their conquests and defeats, pestilence, floods, and other disasters, the names of their principal men, their art development, and perhaps the social life of their rulers and priests.

Science News-Letter, August 13, 1927

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GV Sports and amusements. Games.
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Q Science. General.
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QB Astronomy.
QC Physics.
QD Chemistry.
QE Geology.
QH Natural history.
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QM Human anatomy.
QP Physiology.
QR Bacteriology.
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SH Fish culture and fisheries.
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110 Metaphysics
120 Special metaphysical topics
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140 Philosophical systems
150 Mental faculties. Psychology
160 Logic
170 Ethics
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190 Modern philosophers
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220 Bible
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Anniversaries of Science

August 18, 1868—Solar prominences studied spectroscopically during an eclipse showed a new line which was given the name "helium" by Lockyer.

The chromosphere is full of marvels. At first, when our knowledge of spectra was very much more restricted than now, almost all the lines observed were unknown. In 1868 I saw a line in the yellow, which I found behaved very much like hydrogen, though I could prove that it was not due to hydrogen; for laboratory use the substance which gave rise to it I called helium.

—Sir Norman Lockyer: *The Chemistry of the Stars,* an address given in 1898.

Science News-Letter, August 13, 1927

August 19, 1698—Edmund Halley, who computed the orbit of the famous comet, was commissioned captain of the Paramour Pink, with which he made a two-years' cruise observing the variations of terrestrial magnetism.

After Halley had made two attempts to establish a working theory respecting the distribution of terrestrial magnetism and the cause of its striking change with the lapse of years—the so-called secular variation—he must have reached the conclusion that the elusive problem of the earth's magnetism would be more profitably advanced by additional facts than by further speculation. That, paraphrasing Seneca, to avoid making a false calculation of matters, it were better to advise with Nature rather than with opinion. Accordingly we find him setting out in October, 1698, in command of a sailing ship, the *Paramour Pink,* and cruising in her under orders from the British Government, back and forth, north and south, in the Atlantic Ocean for two years, observing almost daily, sometimes several times in a day, the angle which the compass needle makes with the true north and south line—the angle known to the man of science as the magnetic declination, to the mariner and surveyor as the "variation of the compass."

—Bauer: *The Earth's Magnetism,* a lecture given in 1913.

Science News-Letter, August 13, 1927

August 21, 1560—The appearance of a predicted solar eclipse turned Tycho Brahe toward the study of astronomy. He was not quite fourteen years old at the time.

Though it was only a small eclipse at Copenhagen, it attracted the special attention of the youthful student, who had already begun to take some interest in the astrological predictions or horoscopes which in those days formed daily topics of conversation. When he saw the eclipse take place at the predicted time, it struck him as something divine that men could know the motion of the stars so accurately that they could long before foretell their places and relative positions. He therefore lost no time in procuring a copy of the Ephemerides of Stadius in order to satisfy his curiosity as to astronomical matters; and not content with the meagre information he could get from this book, he very soon made up his mind to go to the fountainhead, and at the end of November in the same year he invested two Joachims-thaler in a copy of the works of Ptolemy, published at Basle in 1551. This copy is still in existence, and may be seen in the University Library at Prague.

—Dreyer: *Tycho Brahe.*

Science News-Letter, August 13, 1927

HYGIENE

Thumb Sucking Dangerous

A baby's habit of filling in tiresome waits between meals by sucking his thumb, a pacifier or his cheek, is not so harmless a pastime as mothers generally think. If long continued, these childish habits result in protruding teeth that fail to meet property for chewing or in other abnormalities of the mouth.

This is one of the important facts made clear in an investigaton of dental development by Dr. Samuel J. Lewis and Dr. Ira A. Lehman, of Detroit. Another still more important and more hopeful fact is that if such habits are stopped the child's mouth structures often tend to right themselves and to grow toward normal again.

Until recently, dental surgeons regularly treated irregularities of the teeth and dental arches by fitting mechanical contrivances to the mouth, Dr. Lewis explains. But sometimes after the appliances were removed the teeth reverted to the original abnormalities, and then again, it had been discovered that apparent abnormalities sometimes righted themselves without mechanical interference.

To find out more about the normal growth of the mouth and teeth, the two doctors began to take measurements and make models at regular intervals of 150 children at the Merrill-Palmer Nursery School. This school is one of the well-known centers where normal child growth and development are being studied carefully from many angles.

Three years ago, Dr. Lewis began to make models of the teeth of each child once a year, starting at the age of three, with the idea of continuing for a period of at least ten years. Every six months measurements of the teeth and dental arches are also taken, so that these may be correlated with measurements of the growth of other parts of the body. None of these children has ever worn mechanical dental appliances, for the purpose of the study is to learn about natural growth.

The models so far made show that sucking and biting of finger, thumb, tongue, cheek and pacifiers all affect mouth structure, Dr. Lewis states. In one case, a twin girl, very much undersized, had teeth lacking enamel due to the mother's poor health and defective diet. The baby not only sucked her thumb but nursed from a bottle at three and a half years of age. Models and measurements showed clearly how the baby's upper teeth protruded and how she could not get her front teeth together. Dr. Lewis told the mother that the baby must give up the thumb-sucking habit and also the bottle, and the mother promised to follow instructions. A year and a half later new models were made and the child's mouth had become normal, without the need of mechanical devices.

An investigation similar to that at the Merrill-Palmer School is being conducted at Teachers' College, in New York, Dr. Lewis states. Other institutions should also collect data on the subject, he believes, because "it is only through the combined efforts of many research workers that we will be able to reap the benefits of this important work."

Science News-Letter, August 13, 1927

METEOROLOGY

Hottest Place On Earth

The days are here when we enjoy just thinking of the coldest spot on earth. That imaginary comfort may be enhanced by a knowledge of the exact time and location of the coldest known temperature. Verkhoyansk, Siberia, just within the Arctic Circle, experienced 90.4 degrees below zero Fahrenheit on January 15, 1885. It was unofficially reported that this same place recently broke the above record with 97.6 degrees below.

However, do not start for Verkhoyanak for your vacation, for the temperature rises to 80 degrees during the two-month summer. Miles City, Mont., holds the low record for the United States with 65 degrees below.

It may help the fellow who must enjoy the sea breeze of an electric fan to know of a hotter spot than his own chair. The Italian meterological station of Azizia registered 136.4 degrees Fahrenheit in the shade on September 13, 1922. Azizia is in the semi-desert plain of Jefara, northern Africa. The mean annual temperature for this region is 70.8 degrees.

Before Azizia established her hottest day California's similar arid inland plain held the world's record with 134 degrees in the shade. This was at Greenland Ranch on the edge of Death Valley where the thermometer goes higher than 120 degrees every summer. Officials at the weather bureau question Azizia's record because the conditions under which the 136.4 degrees were obtained were not certainly proper.

Science News-Letter, August 13, 1927

The Problem of Translation—

¶Science, probing the unknown universe, writes its findings in cryptic language. A stellar galaxy shining faintly in the heavens hides its splendor and its immensity in numbers and formulæ; a minute germ has thrust upon it a long Latin name. With the aid of such scientific shorthand and such technicalities, science pushes on to new discoveries and new heights.

¶Yet the facts and the methods of science must penetrate and permeate the whole fabric of civilization if the world is to become an increasingly better place to live in. The man in the street, the child in the school, the merchant in the counting house, the judge on the bench, the priest in the temple, all of those who make the world, must know, appreciate, understand and cherish the spirit of research and the power of thought.

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